WHAT IS CLAIMED IS:

1. An optical diffusion film for rear projection type display devices, which comprises:

a transparent base layer,

a layer of transparent microspheres formed over said transparent base layer so that each said transparent microsphere is partly embedded in said transparent base layer; and

a light absorbing layer formed over said transparent base layer at one of opposite sides so as to leave each said transparent microsphere partly bare, said light absorbing layer being made of a coloring material convertible to fine metal particles under specified conditions.

2. An optical diffusion film as described in claim 1, and further comprising a transparent substrate on which said transparent base layer is formed.

3. An optical diffusion film as described in claim 2, wherein said coloring material comprises silver behenite.

4. An optical diffusion film as described in claim 2, wherein said coloring material for said transparent base layer material contains a reducing material.

5. An optical diffusion film as described in claim 4, wherein said reducing material comprises a gallic acid.

6. An optical diffusion film as described in claim 1, wherein said transparent microspheres are between approximately 3 μm and approximately 50 μm in volumetric mean size.

7. An optical diffusion film as described in claim 6, wherein said transparent microspheres are between approximately 3 μm and approximately 15 μm in volumetric mean size.for use with a display device having a distance of distinctive vision of approximately 300mm.

8. An optical diffusion film as described in claim 6, wherein said transparent microsphere is between approximately 10 μm and approximately 50 μm in volumetric mean size when said optical diffusion film is for use with a display device having a distance of distinctive vision of approximately 2 m.

9. An optical diffusion film comprising:

a transparent base layer;

a layer of transparent microspheres distributed in a random pattern over said transparent base layer so that each said transparent microsphere is partly embedded in said transparent base layer;

a first light absorbing layer formed over one of opposite surfaces of said transparent base layer so as to leave each said transparent microsphere partly bare; and

a second light absorbing layer formed over another surface of said transparent base layer, said second light absorbing layer having transparent areas arranged in a pattern mating said random pattern of distribution of said transparent microspheres.

10. An optical diffusion film as described in claim 9, and further comprising a transparent binder layer formed over said first light absorbing layer and said layer of transparent microspheres.

11. An optical diffusion film as described in claim 9, and further comprising a transparent substrate on which said second light absorbing layer, said transparent base layer and said first light absorbing layer are formed.

12. An optical diffusion film as described in claim 9, wherein said coloring material for said transparent base layer material contains a reducing material.

13. An optical diffusion film as described in claim 12, wherein said reducing material comprises a gallic acid.

14. An optical diffusion film as described in claim 9, wherein said transparent microsphere has a volumetric mean size between approximately 0.5 μm and approximately

50 μm.

15. An optical diffusion film as described in claim 9, wherein said first light absorbing layer comprises one of a negative type of photosensitive coloring material and a black dye.

16. An optical diffusion film as described in claim 9, wherein said second light absorbing layer comprises a negative type of photosensitive coloring material.

17. An optical diffusion film as described in claim 9, wherein said first light absorbing layer comprises one of a negative type of photosensitive coloring material and a black dye.

18 An optical diffusion film as described in claim 9, wherein said first light absorbing layer is made of a material convertible to fine metal particles under specified conditions.

19. An optical diffusion film as described in claim 9, wherein said coloring material comprises silver behenite.

20. An optical diffusion film as described in claim 19, wherein said reducing material comprises a gallic acid.

21. A process of producing an optical diffusion film which comprises at least a transparent base layer, a layer of transparent microspheres over said transparent base layer so that each said transparent microsphere is partly embedded in said transparent base layer; and a light absorbing layer over said transparent base layer leaving each said transparent microsphere partly bare, said optical diffusing film comprising the steps of:

forming a transparent base layer on a transparent substrate;

distributing transparent microspheres in a layer over said transparent base layer so that each said transparent microsphere is partly embedded in said transparent base layer; and

forming a light absorbing layer over said transparent base layer leaving each said transparent microsphere partly bare by coating a solution layer of coloring material that is convertible into fine metal particles under specified conditions and treating said solution layer of coloring material under said specified conditions so as thereby to convert said solution layer of coloring material into a layer of fine metal particles as said light absorbing layer.

22. A process of producing an optical diffusion film as described in claim 21, wherein said layer of transparent microspheres on said transparent base layer is heated so as to partly embed each said transparent microsphere in said transparent base layer.

23. A process of producing an optical diffusion film as described in claim

21, wherein said layer of transparent microspheres on said transparent base layer is heated through a heat conductive flexible sheet put over said layer of transparent microspheres.

24. A process of producing an optical diffusion film as described in claim 23, wherein said heat conductive flexible sheet comprises silicone rubber.

25. A process of producing an optical diffusion film which comprises at least a transparent base layer, a layer of transparent microspheres with each said transparent microsphere partly embedded in said transparent base layer, a first light absorbing layer formed over one of opposite surfaces of said transparent base layer so as to leave each said transparent microsphere partly bare, and a second light absorbing layer formed over another surface of said transparent base layer, said second light absorbing layer having transparent areas arranged in a pattern mating said random pattern of distribution of said transparent microspheres, said optical diffusion film producing process comprising the steps of:

forming a transparent base layer on a transparent substrate;

distributing transparent microspheres in a random pattern over said transparent base layer so that each said transparent microsphere is partly embedded in said transparent base layer;

forming a first light absorbing layer over one of opposite surfaces of said transparent base layer leaving each said transparent microsphere partly bare; and

formoing a second light absorbing layer over another surface of said transparent base layer by forming a preparatory layer of photosensitive coloring material, exposing said

preparatory layer of photosensitive coloring material to light through said layer of transparent microspheres from a side of said first light absorbing layer and developing said preparatory layer of photosensitive coloring material to color said preparatory layer of photosensitive coloring material in a pattern complementary to said random pattern of distribution of said transparent microspheres.

26 A process of producing an optical diffusion film as described in claim 25, and further comprises the steps of; forming a transparent binder layer over said optical diffusion film at a side opposite to said transparent base layer; and peeling said transparent substrate apart from said transparent base layer; before forming said second light absorbing layer.

27. A process of producing an optical diffusion film as described in claim 25, wherein said first light absorbing layer is formed by forming a layer of photosetting material, exposing said layer of photosetting material and developing said exposed layer of photosetting material.

28. A process of producing an optical diffusion film as described in claim 25, wherein said first light absorbing layer is formed by forming a layer of photosetting photosensitive material, exposing said layer of photosetting material and developing said exposed layer of photosetting material.

29. A process of producing an optical diffusion film as described in claim 27, and further comprises the step of removing redundant margin of said first light absorbing layer spreading into an intended light transmissible area of said transparent microsphere

30. A process of producing an optical diffusion film as described in claim 25, wherein said layer of transparent microspheres on said transparent base layer is heated so as to partly embed each said transparent microsphere in said transparent base layer.

31. A process of producing an optical diffusion film as described in claim 30, wherein said layer of transparent microspheres on said transparent base layer is heated through a heat conductive flexible sheet put over said layer of transparent microspheres.

32. A process of producing an optical diffusion film as described in claim 31, wherein said heat conductive flexible sheet comprises silicone rubber.

33. A process of producing an optical diffusion film as described in claim 31, wherein said first light absorbing layer is formed by forming a layer of coloring material that is convertible into fine metal particles under specified conditions and treating said layer of coloring material under said specified conditions so as thereby to convert said layer of coloring material into a layer of fine metal particles.

34. A process of producing an optical diffusion film as described in claim 33, wherein said layer of transparent microspheres on said transparent base layer is heated so as to partly embed each said transparent microsphere in said transparent base layer.

35. A process of producing an optical diffusion film as described in claim 34, wherein said layer of transparent microspheres on said transparent base layer is heated through a heat conductive flexible sheet put over said layer of transparent microspheres.

36. A process of producing an optical diffusion film as described in claim 35, wherein said heat conductive flexible sheet comprises silicone rubber.